

What is claimed is:

1. An image projection system configured to enhance quality of an image on a screen, the system comprising:

5 an illumination source configured to produce light and direct light along an optical path; and

a time-varying focus device disposed in the optical path and configured to periodically alter incident light to enhance quality of the image on the screen.

10 2. The image projection system of claim 1, wherein the time-varying focus device is configured to periodically diverge incident light.

3. The image projection system of claim 1, wherein the time-varying focus device is configured to periodically converge incident light.

15 4. The image projection system of claim 1, wherein the time-varying focus device is configured to sequentially diverge and converge incident light.

20 5. The image projection system of claim 1, wherein the time-varying focus device includes a reflective lens.

6. The image projection system of claim 1, wherein the time-varying focus device is a variable-curvature mirror.

25 7. The image projection system of claim 6, wherein the variable-curvature mirror employs a piezo element to alter curvature of the mirror.

8. The image projection system of claim 6, wherein the variable curvature mirror is a bimorph mirror.

9. The image projection system of claim 6, wherein the
5 variable-curvature mirror is configured to alternate between a generally planar state and a generally curved state.

10. The image projection system of claim 1, wherein the time-varying focus device includes a refractive lens.

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11. The image projection system of claim 1, wherein the time-varying focus device is a wheel having regions of differing optical characteristic.

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12. The image projection system of claim 11, wherein the focus wheel includes at least one curved lens region.

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13. The image projection system of claim 1, wherein the time-varying focus device includes at least two focus wheels with a first focus wheel configured to cause the incident light beam to horizontally diverge and a second focus wheel configured to cause the incident light beam to vertically diverge.

14. The image projection system of claim 1, wherein the time-varying focus device is configured to selectively alter incident light to change intensity of the image on the screen.

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15. A display system configured to enhance the quality of an image on a screen, the system comprising:

an illumination source configured to direct light along an optical path;

5 a spatial light modulator adapted to modulate the light into a plurality of discrete light beams, each light beam configured to project a light spot on the screen of a first size; and

10 a variable focus device disposed in the optical path and configured to vary size of light spots on the screen between the first size and a second size such that a corresponding image portion on the screen rapidly alternates between a focused state and a defocused state to enhance the appearance of the image.

16. The display system of claim 15, wherein the variable focus device includes a diverging lens adapted to be periodically disposed in the optical path.

17. The display system of claim 15, wherein the variable focus device includes a reflective lens periodically disposed in the optical path.

20 18. The display system of claim 15, wherein the variable focus device includes a refractive lens periodically disposed in the optical path.

19. The display system of claim 15, wherein the variable focus device is a deformable mirror array.

25 20. The display system of claim 19, wherein the spatial light modulator includes the variable focus device.

21. The display system of claim 19, wherein the deformable mirror array includes a plurality of electrically addressable actuators that controllably deform portions of the mirror array to selectively alternate an image portion between a focused state and a defocused state.

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22. The display system of claim 19, wherein the deformable mirror array is an array of bimorph mirrors.

23. The display system of claim 13, wherein the variable focus device is a focus wheel having regions of differing optical characteristics, the focus wheel being rotated to sequentially place such regions of differing optical characteristics into the optical path.

24. A method for enhancing the quality of an image on a screen, 15 the method comprising:

providing an illumination source configured to generate a light beam;

20 directing the light beam from the illumination source along an optical path to produce image frames on a screen, wherein each image frame has a focal length; and

selectively altering the focal lengths of the image frames to produce interleaved image frames having differing focal lengths on the screen.

25. The method of claim 24, wherein selectively altering the focal lengths includes sequentially altering the focal length.

26. The method of claim 24, wherein selectively altering the focal lengths includes rapidly focusing and defocusing sequential image frames.

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27. A display device configured to display an image on a screen, the system comprising:

- illumination means for producing a light beam;
- light modulating means for directing the light beam onto a screen to
- 5 form an image; and
- variable focus means for successively varying size of the light beam such that the image on the screen alternates between a focused and an unfocused state.